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You do the math
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ABSTRACT: Edward Wong, senior VP of logistics planning and allocation for
The Gymborree Corp., is trying to predict the movement of merchandise. It
is up to Wong to minimize the amount of merchandise on hand that becomes
outdated when the seasons change. Markdowns are the most obvious means of
moving merchandise out of the store before it becomes outdated, but there
is no exact science to balancing the need for margins against the need to
liquidate stale stock. Mathematics has provided Wong with his solution.

TEXT: Gymboree formulates a smart markdown solution

In the movie "Pi," the ridiculously brainy protagonist speculates he can
make a fortune by inventing a mathematical formula that predicts the
seemingly random fluctuations of the stock market. Edward Wong is trying to
predict the movement of stock of a dif ferent kind: merchandise.

As senior VP of logistics planning and allocation for children's apparel
retailer The Gymboree Corp., it falls to Wong to spread the chain's
inventory between 607 stores in a way that addresses local demand. It's
also his job to minimize the amount of merchandise on hand that becomes
outdated when the seasons change.

Markdowns are the most obvious means of moving merchandise out of the store
before it becomes outdated, but there is no exact science to balancing the
need for margins against the need to liquidate stale stock. Generally, it
involves guesswork and can have an unpleasant impact if the retailer errs
too much in either direction. Wong and his colleagues managed to take much
of the guesswork out of the job by implementing a solution that processes
historical data into a set of recommended discount schedules that optimize
margins while getting inventory out the door fast enough to make way for
the new shipments.

With the algorithm's suggestions, Wong and his colleagues were able to time
markdowns so that they went into effect on a floor set as soon as its sales
began to dip. The discounts send sales of those floor sets rising again
without placing unnecessary burdens on margins. The upshot was a sevenfold
return on Gymboree's investment in the project.

"As a retailer, markdowns are a fact of life," Wong says. 'The best you can
do is to deploy business-intelligence tools as they relate to price

management and to maximize your gross margin while working toward a zero-out date. We'll take markdowns if the threat of outdated merchandise justifies it, but we don't want to cut into margins any more than we have to."
Mathematics provided the solution to Gymboree's outdated-merchandise problem.

Wong is pleased with the way the project turned out. "We didn't want to go of ter a pie-in-the-sky ideal solution, but we did want a solution that would help us adapt our business to the realities we were facing, and we needed something we could deploy rapidly. It also had to be a low-maintenance solution which would sustain us for the future. The solution we arrived at fit the bill.

Finding the formula: To maximize profitability while staving off inventory obsolescence would be a challenge at any seasonally driven business, but at Gymboree the challenge is compounded by the fact that the merchant's offerings are set-oriented. Garments in a single floor set revolve around a theme, for example, race cars or teddy bears. The items are designed to be worn with each other, which makes it difficult for budget-minded mommies to cherrypick the leftovers. The result is unwanted garments populating the racks after their seasonal window has passed.

New floor sets flow into Gymboree's stores 12 to 15 times a year. When the new assortments arrive, they displace older floor sets from the front of the store to the middle, where the older merchandise is marked down. Previously discounted stock is, in turn, bumped to the back of the store, where it receives a further markdown. The retailer then is forced to remove from the floor any items that had previously survived two markdowns without a sale. With only a 1,500-sq.-ft. to 1,700-sq.-ft. footprint, Gymboree has little other choice.

Gymboree operates 607 stores in the United States, Canada and Great Britain. Included in that number are 19 stores under the Zootopia banner, an apparel format Gymboree launched last year for children aged seven to 16. Gymboree's target demographic in its core chain is children up to six years old. The retailer's assortment is entirely private label, most of it manufactured offshore.

Gymboree was the sweetheart of the mall a few years ago with $800 in annual sales per square foot, the highest in the specialty sector, Wong boasts. But when sales began to plateau in late 1997, management decided it was time for a growth initiative. The opening of 100 new stores ensued in the following year, and the company made a heavy investment in inventory in the hopes it would drive sales. But according to Wong, "Things didn't work out exactly as planned."

Sales failed to meet expectations. Worse still, Gymboree hadn't built the infrastructure necessary to support its new additions. The retailer's growth effort became a massive source of internal frustration, and resulted in a major staff turnover which left the retailer less able to tackle its new problems.

"When you open 100 stores in a year, it puts a strain on the organization," Wong explains.

Stock was still arriving in a heady flow thanks to the retailer's heavy investment in merchandise, but canceling the incoming orders wasn't an option. Gymboree didn't want its private-label merchandise in the hands of jobbers or secondary channels. But the sales boost that was expected to finance that investment fell short. "In the short term, our basic goal was to get the money," Wong says.

Gymboree needed to move its excess merchandise. Fast. Liquidation was the obvious solution, but Wong and his colleagues knew that it would be

necessary to leverage some external competency toward that end, because the planning and allocation-management tools that were in place at the time left something to be desired. At the same time, Gymboree needed to find a way to recover from the employee exodus that had weakened it.
The retailer addressed the humanresources problem by revamping its organizational structure and supplementing its training curriculum with software from Atlanta-based Centurion Systems. As far as Gymboree's allocation problems went, the apparel vendor installed pre-season planning and in-season financial-planning and forecast-management solutions from Makoro, which is now owned by Dallas-based i2 Technologies. It also hired J.D. Arthur to handle initial allocations and replenishments, and purchased OLAP tools from San Jose, Calif.-based Business Objects Americas.

Exam time: Wong also turned to mathematical analysis in his effort to rid Gymboree of its overstock. He'd had a successful experience using price--management algorithms at Mervyn's California, a previous employer of his.

Wong's decision to go with a mathematical price-analysis method stemmed from Gymboree's need for a lasting solution. "We didn't want to go after something that would end up being a throwaway fix. We wanted something permanent." Gymboree also required a streamlined solution that could feed its results back into the price-management system.

It was mid-1998 by this point. Wong needed a solution in place by the fourth quarter. '"The holidays were coming, but sales revenues weren't at the top of our mind. Margin was!"
Gymboree began discussions with Boston's Technology Strategy Inc. in August of 1998. September and October were spent analyzing two years of electronic sales data, plus another year of data that had to be keyed in from paper records. "At one point, our entire staff turned into data-entry people," Wong says.

In November of 1988, Gymboree deployed a solution tailor-made by TSI according to the retailer's metrics and constraints. Most importantly, there had to be zero outdated merchandise, and gross margin had to be maximized. The data engine crunched three years of sales numbers into an index of practical performance indicators based on the historical evidence with the given constraints taken into account.

But the results, Wong explains, were not merely based upon an assumption that history would repeat itself. "The algorithm provided ways of tracking patterns between numbers. A whole slew of metrics were taken into account, such as when markdowns occurred, the sales lifts that resulted and what part of the season they occurred in."

There was some subjectivity in interpreting the results. "It's not the kind of thing you can set entirely on autopilot," Wong explains. "But having projections available based on impartial mathematics enabled us to reduce the subjectivity we ordinarily would've had to use in making markdown schedules."

Sometimes the markdowns the solution suggested were not immediately obvious. For example, often an accessory would be marked down even when historical evidence showed it could be successfully sold at the same price for a while longer. The markdown would coinside with a similar discount on a clothing item that was designed to be worn with the accessory. The discount of the accessory, the numbers indicated, would spur sales of the matching garment. The data engine also identified correlations between sales of apparel for boys and girls; some parents had one of each.

The mathematical experiment was a success. Before the fourth quarter of 1998 was out, Gymboree's return was seven times what it spent on the markdown algorithm. Gymboree is currently working with TSI to develop a similar data engine for earnings projections. The retailer is also looking into introducing a store   cluster   pricing model.

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